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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/768,180

02/02/2004

Tsuyoshi Fujihara

040039

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08/29/2006

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EXAMINER

MORAN, MARJORIE A

ART UNIT

PAPER NUMBER

1631

DATE MAILED: 08/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/768,180	FUJIHARA ET AL.	
	Examiner	Art Unit	
	Marjorie A. Moran	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 3,5,7-10 and 13-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6,11,12,19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>5/14/04</u> . | 6) <input type="checkbox"/> Other: _____ |

Election/Restrictions

Applicant's election of species of A) polymer which is DNA and B) functional group of positive hole-transporting, specifically, TPD, and C) functional element of transistor in the reply filed on 6/5/06 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 3, 5, 7-10, and 13-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 6/5/06.

An electronic device, specifically a transistor, comprising DNA "modified" with (interpreted to be complexed with or bound to) TPD is free of the prior art, therefore the search was expanded to another hole transporting functional group, phenothiazine.

An action on the merits of claims 1, 2, 4, 6, 11, 12, 19, and 20, as they read on the elected species of DNA, positive-hole transporter, and transistor, follows.

Priority

Should applicant desire to obtain the benefit of foreign priority under 35 U.S.C. 119(a)-(d), a translation of the foreign application should be submitted under 37 CFR 1.55 in reply to this action.

Information Disclosure Statement

The IDS filed 5/14/04 has been considered by the examiner. It is noted that only the first page of each reference cited was filed with the IDS, therefore only the first page of each document has been considered. The examiner's initials do NOT indicate that the entirety of each document has been considered. Applicant that if consideration of the entirety of each document is desired, then the appropriate page numbers must be cited in proper format on an IDS and the entire document must be filed.

Specification

The abstract of the disclosure is objected to because the first "sentence" is incomplete. Correction is required. See MPEP § 608.01(b).

Claim Objections

Claim 4 recites several abbreviations for chemical structures. These abbreviations are defined in the specification, therefore the claims are not indefinite. However, for further clarity, applicant is requested to recite the full term the first time each abbreviation appears in the claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6, 11, 12, 19 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 6, 11, and 12 each recite the term "said functional element" in line 2. Parent claim 1 limits an electronic device to comprise "one or more functional elements" therefore the antecedent basis for "said functional element" is unclear; i.e. it is unclear if applicant intends to limit only one functional element of the device of claim 1, wherein other functional elements may be different, intends to limit all the functional elements recited in claim 1, or intends a different functional element altogether. For this reason, the claims are indefinite. Claims 19 and 20 depend from claims 11 and 12 and are therefore also indefinite for this reason.

Claim 12 limits the electronic device of claim 1 to be produced by certain steps. It is unclear what functional or structural limitation of the device of claim 1 is intended by recitation of process steps, therefore claim 12 is indefinite. For purposes of search and applying the prior art, claim 12 is interpreted to limit a functional element to a conductive wire.

Claim 20 limits the device of claim 11 to a FET "which can be controlled..." by application of an electric field. It is unclear what limitation of the device (product) of claim 11 is intended by recitation of an apparent method step (applying an electric field). Use of the phrase "can be" renders it further unclear whether the control and/or application are intended to be positive limitations of the claim. For these reasons, claim

20 is indefinite. For purposes of search and applying the prior art, claim 12 is interpreted to limit the device to be a FET.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 4, 6, 11, 12, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over WATANABE et al. (US 6,486,489 in view of TIERNEY et al. (J. Org. Chem. (2000) vol. 65, pp. 5355-5359).

WATANABE teaches a transistor comprising DNA wires; i.e. carrier transporting material (col. 12, lines 11-26). WATANABE further teaches that his transistor may be a FET (col. 6, lines 40-42 and col. 8, lines 20-26) and that his DNA may be a block (col. 8,

lines 20-26 and col. 11, lines 12-21). WATANABE does not teach DNA complexed with a positive hole-transporter.

TIERNEY teaches DNA complexed with phenothiazine, and teaches that such complexes are more stable than unlabeled (DNA) duplexes and may be used for charge transfer (p. 5358).

It would have been obvious to one of ordinary skill in the art at the time of invention to have used the phenothiazine-complexed DNA of TIERNEY in the transistor of WATANABE where the motivation would have been to improve the transistor by using a more stable DNA duplex which retains properties similar to the DNA used by WATANABE.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over WATANABE et al. (US 6,486,489 in view of TIERNEY et al. (J. Org. Chem. (2000) vol. 65, pp. 5355-5359) as applied to claims 1, 2, 4, 6, 11, 12, 19, and 20 above, and further in view of KRONLAGE (GB 1278281).

WATANABE and TIERNEY make obvious a transistor, specifically a FET, comprising DNA complexed with phenothiazine, as set forth above. WATANABE and TIERNEY do not specifically teach a transistor with a PHP or NPN junction.

KRONLAGE teaches FET transistors with PNP and NPN junctions (Page 3, lines 95-99).

It would have been obvious to one of ordinary skill in the art at the time of invention to have made any type of FET transistor as made obvious by WATANABE

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and TIERNEY, including one with PNP and/or NPN junctions, as taught by KRONLAGE where the motivation would have been to optimize performance of the transistor, as taught by KRONLAGE (page 3, lines 118-121).

Conclusion

No claim is allowed.

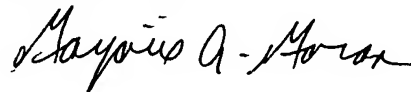
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marjorie A. Moran whose telephone number is (571) 272-0720. The examiner can normally be reached on Monday-Friday; 6 am-2:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571)272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Marjorie A. Moran
Primary Examiner
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8/21/06